

Atty. Docket No. 005651/ETCH/CHMBR/JB1
PATENT APPLICATION

AMENDMENT UNDER 37 C.F.R. §1.111
U.S. Application No. 09/834,343

REMARKS

Claims 1-10 and 14-18 are all the claims pending in the application, claims 17 and 18 having been added to claim the disclosed invention move completely.

Claims 1, 8-10 and 14 stand rejected under 35 U.S.C. 103(a) as being unpatentable over USP 5,766,364 to Ishida et al. in view of USP 5,268,034 to Vukelic. Claims 5, 7 and 15 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Ishida in view of USP 5,997,649 to Hillman. Applicants respectfully traverse these rejections, and request reconsideration and allowance of the pending claims in view of the following arguments.

Claim 1 of the present application recites a plasma reactor electrode comprising an upper plate, a lower plate and a plurality of pins, wherein the upper and lower plates are connected with the pins to form a plenum chamber. The Examiner has asserted that a heat conductor 109, a gas ejector plate 105, and a plurality of bolts 30b in Ishida teach the recited upper plate, lower plate, pins respectively. The Examiner has also asserted that the heat conductor 109 and the gas ejector plate 105 in Ishida are connected with the bolts 30b to form gas pressure equalizing spaces 109a and gas passages 109d, which the Examiner asserts constitute the claimed plenum chamber. Applicants respectfully disagree, and assert that the cited parts in Ishida fail to form a plenum chamber.

Ishida provides a plasma processing apparatus which could dissipate heat to prevent thermal deformation of a gas ejector plate. As shown in Fig. 1, the Ishida apparatus includes a temperature controlling plate 106, a heat conductor 109 of grid-like shape forming gas pressure

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equalizing spaces 109a in each cell defined by crossing bars of the grid, and a electrode-cum-gas ejector plate 105 (Ishida, col. 3, lines 22-29). The heat conductor 109 and the gas ejector plate 105 are fastened to each other by bolts 30b through holes 32b of the heat conductor 109 into thread holes 33b provided on the gas ejector plate 105 (Ishida, col. 4, lines 15-18).

The grid-like shape of the heat conductor 109 is shown in Fig. 2 more clearly. Because of the grid-like (i.e. open or non-solid) shape of the heat conductor 109, the heat conductor 109 and the gas ejector plate 105, fastened to each other by bolts 30b, cannot form an enclosed space. Rather, the resulting structure will be open at one end.

In contrast, the claims clearly recite the formation of a chamber. "Chamber" means an "enclosed space or compartment", The American Heritage Dictionary of the English Language, third edition. The same dictionary defines "plenum" as "a condition, space, or enclosure in which air or other gas is at a pressure greater than that of the outside atmosphere". Thus, it is impossible for the heat conductor 109, the gas ejector plate 105 and bolts 30b, the parts in Ishida cited by the Examiner, to form a chamber, much less the recited plenum chamber.

Although the temperature controlling plate 106 and the gas ejector plate 105 in Ishida may form an enclosed space, these two parts are not connected by bolts. As shown in Fig. 2 of Ishida, the heat conductor 109 and the gas ejector plate 105 coupled to each other by the bolts 30b are then fastened to the temperature controlling plate 106 by bolts 30a through holes 32a in the middle of the temperature controlling plate 106 into thread holes 33a near the center of the heat conductor plate 109 (Ishida, col. 4, lines 28-33). In other words, in Ishida, the gas ejector plate 105 is fastened to the heat conductor 109, which is then fastened to the temperature

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controlling plate 106. There are no bolts connecting the temperature controlling plate 106 and the gas ejector plate 105.

Thus, Ishida fails to teach or suggest the claimed structure which forms the recited plenum chamber.

None of other cited references supplies the deficiencies of Ishida.

The Examiner has agreed that Ishida fails to teach that the pins are made of a thermally conductive material, but has asserted that Vukelic provides such pins. The Examiner then combines Ishida and Vukelic to reject claims of the present application. Applicants respectfully disagree.

The Ishida apparatus is used for plasma processing, while Vukelic provides a fluid dispersion head for Chemical Vapor Deposition (CVD). Thus, Ishida and Vukelic are related to two different types of film forming technologies. There is no suggestion or motivation to combine these two cited references.

In addition, because of the lack of the structure in Ishida to form the recited plenum chamber, even if one skilled in the art were to combine the teachings of Ishida, with that taught by Vukelic, the resulting combination would not result in the invention recited in claim 1.

Accordingly, Applicants respectfully submit that claim 1 and its dependent claims 2-10 and 17 are patentable.

Independent claim 14 recites a plasma reaction chamber comprising a plasma reactor electrode, comprising an upper plate, a lower plate and a plurality of pins being made of a thermally conductive material, wherein the upper and lower plates are connected with the pins to

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form a plenum chamber. Accordingly, Applicants respectfully submit that claim 14 and its dependent claims 15-16 and 18 are patentable for the same reasons as those for claim 1.

Applicants have demonstrated in the independent claims arguments above that Ishida does not teach or suggest at least two features that are recited in those claims, and that it is improper to combine Ishida and Vukelic. Accordingly, claims 5, 7 and 15 are patentable at least by virtue of their dependency from the patentable independent claims.

In addition, the Examiner has agreed that Ishida fails to teach the O-rings recited in claims 5, 7 and 15, but has asserted that Hillman provides the recited O-rings. The Examiner then combines Ishida and Hillman and rejects these claims. Applicants respectfully disagree. The O-rings recited in these claims are used to form the plenum chamber with the upper and lower plates. Because the cited references do not teach or suggest the claimed upper and lower plates which could form a plenum chamber, there is no need for these O-rings neither. Thus, there is no suggestion or motivation to pick the O-rings in Hillman and add them to the Ishida apparatus. Accordingly, Applicants respectfully submit that claims 5, 7 and 15 are patentable for this additional reason as well.


In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

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Respectfully submitted,



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CERTIFICATE OF FACSIMILE TRANSMISSION

I hereby certify that this AMENDMENT UNDER 37 C.F.R. § 1.111 is being facsimile transmitted to the U.S. Patent and Trademark Office this 14th day of April, 2004.


Thea K. Wagner